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PNEUMATIC OR CUSHION ARCH SUPPORT FOR SHOES

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15 Claims. (Cl. 36—8.5)

This invention relates to shoes, and constitutes an improvement over that set forth in my co-pending application, Serial Number 463,235, filed October 22, 1942, wherein there is shown and described a pair of shoes each provided with a removable arch support, the shoes being so designed that one or the other may be worn on the right as well as on the left foot, and the removable arch supports being formed one for the right foot and the other for the left foot, whereby the arch supports may be interchanged after the shoes are worn, so that the shoe which had been worn on the right foot may be used for the left foot. The advantages inherent in the use of these shoes are clearly set forth in said co-pending application to which reference may be had.

The primary object of this invention is to provide the pair of shoes, each with a built in arch support which comprises a flexible metallic plate support having affixed thereto a pair of juxtaposed inflatable air bladders disposed one on each side of the longitudinal center line of the shoe, so that for the shoe to be worn on the left foot, the air bladder on the right side of the arch support therein is inflated, and for the shoe to be worn on the right foot the air bladder on the left side of the arch support thereof is inflated; and when the shoes become worn and it is desired to change them, i. e., from left to right and right to left, all that is necessary is to deflate the air bladders of the arch support of each shoe and to inflate the complemental air bladder thereof, thereby providing in each of the shoes as interchanged a properly positioned arch support for the foot.

Another object of this invention is to so design the arch support that the flexible metallic plate support is adapted to be engaged by the arch of the foot, the air bladders being disposed between the metallic plate support and the shoe, and when one or the other is inflated, the same will flex the metallic plate upwardly so as to conform in contour with the arch of the foot.

A further object of this invention is to provide the air bladders of each arch support with a stem and air valve suitably built in and affixed to the side walls of the shoe whereby to be accessible and at the same time free of contact with the foot.

A still further object of this invention is to provide strong, durable and inexpensive shoes of the character described which shall be comfortable to wear, attractive in appearance, and yet practical and efficient to a high degree.

With the foregoing and other objects in view, the invention resides in the novel arrangement and combination of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

A practical embodiment of the invention is illustrated in the accompanying drawing, wherein:

Figure 1 is a plan view with parts broken away of the improvement in shoes showing the improved arch-support therein.

Figure 2 is a sectional view taken on line 2—2 of Figure 1.

Figure 3 is a sectional view taken on line 3—3 of Figure 2.

Figure 4 is a detail sectional view taken on line 4—4, Figure 2.

Figure 5 is a partial plan view similar to that of Figure 1 of a modified form arch support in a shoe.

Figure 6 is a partial side elevational view of the shoe of Figure 5.

Figure 7 is a detail sectional view taken on line 7—7 of Figure 6.

Figure 8 is a detail sectional view similar to that of Figure 7 showing a modified form of valve guard.

Referring now in detail to the drawings, 10 designates a shoe embodying the invention. The shoe 10 comprises a sole 11 and a heel 12, the shoe further including an inner sole 13. Attached to the sole 11 is the shoe upper 15. It will be noted that the sole 11 as well as the inner sole 13 are symmetrical about a longitudinal bisecting line; thus, if a line is drawn on the middle of the sole through the heel to the toe, both halves of the sole are exactly the same, this being also true of the heel portion, arch portion or toe portion of the shoe. This type of shoe which is described in my co-pending application, requires a removable and changeable arch support in order to adapt the same shoe to be worn either on the right foot or the left foot. In the shoes as shown in said co-pending application, when a person buys a pair of the same, he receives two exactly similar shoes, such as 10, and a pair of removable right foot and left foot arch supports. Thus, in the shoe to be initially worn on the left foot he places the left foot arch support, and in the other shoe the right foot arch support. When the shoes are worn down and interchanged from right to left and left to right, the arch supports are correspondingly changed.

The invention as will be hereinafter described obviates this changing of arch supports and at the same time provides an improved cushion type of arch-support.

The improved type of cushion arch support is indicated generally by the reference character 17 and comprises a normally flat, thin flexible metal plate 18 and a pair of inflatable air bladders 19 and 20. The metal plate 18 is of heart shaped oval form symmetrical about its major axis and is placed in the shoe with its apex portion directed toward the heel as clearly shown in Figure 1. Preferably the metal plate 18 at its greatest width is of a dimension such as to extend substantially from side wall to side wall of the shoe when placed in the shoe. The metal plate 18 defines on each side of its major axis a flexible wing section 21 and 22, the plate 18 being secured to the shoe along said major axis by the nails or rivets 23. As shown in Figure 1 it will be seen that the metal plate 18 extends substantially the full length of the arch portion of the shoe and is held in place by the nails or rivets 23.

The inflatable air bladders 19 and 20 are identical, are of oval form and flat when deflated, and are made of rubber or other suitable elastic material. Formed integral with a medial edge portion of each bladder 19 and 20 is a flat valve stem 19*a* and 20*a*, respectively, each valve stem being provided at its free end with an air valve 25. The air bladders 19 and 20 are secured each to the underside of the plate wing sections 21 and 22, respectively, as by cementing, vulcanization or other suitable means; and in symmetrical laterally opposed relation with the valve stems 19*a* and 20*a* extending beyond the side edges of said wing sections and disposed in substantially transverse alignment.

The complete arch support 17 is placed within the shoe 10 at the arch portion thereof and is secured to the sole by the longitudinal row of nails or rivets 23. Any suitable means may be utilized for supporting the valve stems of the air bladders on the side walls of the shoe. As the valve stems 19*a* and 20*a* are of flat formation they may be placed inside of the lining of the shoe or they may be encased in a separate lining such as 26, see Figure 4, to be secured in any desired manner to the side wall of the shoe. Preferably the free ends of the valve stems are directed outwardly from the upper edge of the side walls of the shoe, see Figure 3, so that the valves 25 will extend away from the foot. Placed over the arch support 17 is the conventional inner sole 13, although in some instances it may be desirable to place the arch support over the inner sole 13.

From the above description of the shoe and arch support it is apparent that if the shoe, see Figure 1, is to be worn on the right foot, the left air bladder 20 is inflated, see Figure 3, which will result in an upward flexure of the wing section 22 of the metal plate 18. By virtue of the pressure exerted by the foot and the resilient action of the air bladder the wing section 22 will be flexed into conformity with the arch of the foot, providing with the inflated bladder a cushioned arch support. In a like manner the air bladder 19 of the other shoe is inflated to provide a cushioned arch support for the left foot. After becoming worn the shoes may be changed from right to left and left to right, this being effected by the simple expedient of deflating the air bladders of the shoes as originally worn and inflating the complemental air bladder of each arch support whereby to adapt each shoe for use on the opposite foot.

In some instances it may be desirable to have the arch support 17 removable from the shoe in which case the plate 18 may be formed with a heel extension to be engaged by the heel of the foot to thereby prevent longitudinal movement of the arch support within the shoe.

Further the air bladders 19 and 20 may be replaced by a single sponge rubber insert adapted to be moved from beneath one wing section to beneath the other wing section to adapt the shoe for use either on the right or left foot.

In the modification of arch support 29 shown in Figure 5, the heart shaped oval metal plate 18 is replaced with a circular plate 30 secured along a diameter as by the nails or rivets 31 to the sole of the shoe. Each wing section 32 and 33 of the plate 30 is provided with an inflatable air bladder 34 and 35 identical in all respects with the air bladders 19 and 20, including valve stems 34*a* and 35*a*, respectively, and valves 36. The arch support 29 functions in identically the same manner as the arch support 17 of Figure 1. Referring to Figures 6 and 7 it will be noted that the side walls of the shoe are each provided with an elongated opening preferably formed by an elongated grommet 38 through which the free end of a valve stem extends, the oval opening permitting slight movement of the valve stem therein to accommodate the cushioning movement of the air bladder. The grommet 38 is disposed slightly below the upper edge of the side walls of the shoe, see Figure 6, and further acts to prevent the valve 36 from coming into contact with the foot thus obviating any change of chafing. The valve stem is further held in proper position at all times by virtue of the fact that the valve 36 is of greater width than the width of the oval opening.

In Figure 8 the valve stem 40 of the air bladder 41 is located inside of the lining of the shoe and the free end thereof extends upwardly beyond the edge of the shoe. Fixed to said free end is a valve 42. To prevent chafing of the valve 42 against the foot there is provided a U-shaped guard 43 preferably sewn to the shoe as at 44, through the sides of which access to the valve 42 may be had to inflate or deflate the bladder.

Having thus described the invention what is claimed is:

1. In combination with a shoe of the character described; an arch support comprising a flexible plate secured to the sole of the shoe along a line coinciding with the longitudinal center line of said shoe; a pair of inflatable air bladders arranged beneath said plate; whereby upon inflation of one of said air bladders there will be provided a cushioned arch support adapting the shoe for use either on the right foot or the left foot depending on the air bladder selected for inflation.

2. In combination with a shoe of the character described; an arch support comprising a flexible oval shaped metallic plate secured to the sole of the shoe along a line coinciding with the longitudinal center line of said shoe; a pair of laterally disposed inflatable air bladders secured to said metallic plate and arranged beneath said plate; whereby upon inflation of one of said air bladders there will be provided a cushioned arch support adapting the shoe for use either on the

right foot or the left foot depending on the air bladder selected for inflation.

3. In combination with a shoe of the character described; an arch support comprising a flexible metallic plate secured to the sole of the shoe along a line coinciding with the longitudinal center line of said shoe; a pair of inflatable air bladders on opposite sides of said line and arranged beneath said plate and adjacent the side walls of said shoe; valve means connected to each bladder disposed exteriorly of said shoe; whereby upon inflation of a selected one of said air bladders there will be provided a cushioned arch support adapting the shoe for use either on the right foot or the left foot depending on the air bladder selected for inflation, and the portion of the metallic plate engaged by the inflated bladder being flexed to conform to the arch of the foot on which the shoe is worn.

4. In combination with a shoe of the character described; an arch support comprising a flexible metallic plate secured to the sole of the shoe along a line coinciding with the longitudinal center line of said shoe; a pair of inflatable air bladders each secured to said plate on opposite sides of said line and arranged beneath said plate and adjacent the side walls of said shoe; a valve stem and valve means connected to each bladder with the valve means disposed exteriorly of said shoe; whereby upon inflation of a selected one of said air bladders there will be provided a cushioned arch support adapting the shoe for use either on the right foot or the left foot depending on the air bladder selected for inflation, and the portion of the metallic plate engaged by the inflated bladder being flexed to conform to the arch of the foot on which the shoe is worn.

5. In combination with a shoe of the character described; an arch support comprising a normally flat flexible metallic plate secured to the sole of the shoe along a line coinciding with the longitudinal center line of said shoe; said plate defining a pair of like wing sections each extending to a side wall of said shoe; an inflatable air bladder secured to the underside of each plate wing section; a valve stem connected to each bladder and fitted to the side wall adjacent thereto; valve means on the free end of said valve stem arranged exteriorly of said shoe and free of contact with the foot; said plate wing sections and bladders being so constructed and arranged that upon inflation of a selected one of said air bladders there will be provided a cushioned arch support adapting the shoe for use either on the right foot or the left foot depending on the air bladder selected for inflation, the plate wing section associated with the inflated bladder being flexed to conform to the arch of the foot on which the shoe is worn.

6. In combination with a shoe of the character described; an arch support comprising a normally flat symmetrical heart-shaped flexible metallic plate secured to the sole of the shoe along a line coinciding with the major axis thereof and the longitudinal center line of said shoe and said plate arranged with the apex end thereof directed toward the heel of said shoe; said plate defining a pair of like wing sections each extending to a side wall of said shoe; an inflatable air bladder secured to the underside of each plate wing section; a valve stem connected to each bladder and fitted to the side wall adjacent thereto; valve means on the free end of said valve stem arranged exteriorly of said shoe and free of contact with the foot; said plate wing sections and bladders being so constructed and arranged that upon inflation of a selected one of said air bladders there will be provided a cushioned arch support adapting the shoe for use either on the right foot or the left foot depending on the air bladder selected for inflation, the plate wing section associated with the inflated bladder being flexed to conform to the arch of the foot on which the shoe is worn.

7. In combination with a shoe of the character described; an arch support comprising a normally flat circular flexible metallic plate secured to the sole of the shoe along a line coinciding with the diameter thereof and longitudinal center line of said shoe; said plate defining a pair of like wing sections each extending to a side wall of said shoe; an inflatable air bladder secured to the underside of each plate wing section; a valve stem connected to each bladder and fitted to the side wall adjacent thereto; valve means on the free end of said valve stem arranged exteriorly of said shoe and free of contact with the foot; said plate wing sections and bladders being so constructed and arranged that upon inflation of a selected one of said air bladders there will be provided a cushioned arch support adapting the shoe for use either on the right foot or the left foot depending on the air bladder selected for inflation, the plate wing section associated with the inflated bladder being flexed to conform to the arch of the foot on which the shoe is worn.

8. In combination with a shoe of the character described; an arch support comprising a normally flat flexible metallic plate secured to the sole of the shoe along a line coinciding with the longitudinal center line of said shoe; said plate defining a pair of like wing sections each extending to a side wall of said shoe; an inflatable air bladder secured to the underside of each plate wing section; a valve stem connected to each bladder and fitted to the side wall adjacent thereto; opposed elongated openings formed in the side walls of the shoe through each of which a free end of a stem extends; valve means on the free end of said valve stem arranged exteriorly of said shoe and free of contact with the foot; said plate wing sections and bladders being so constructed and arranged that upon inflation of a selected one of said air bladders there will be provided a cushioned arch support adapting the shoe for use either on the right foot or the left foot depending on the air bladder selected for inflation, the plate wing section associated with the inflated bladder being flexed to conform to the arch of the foot on which the shoe is worn.

9. In combination with a shoe of the character described; an arch support comprising a normally flat symmetrical heart-shaped flexible metallic plate secured to the sole of the shoe along a line coinciding with the major axis thereof and the longitudinal center line of said shoe and said plate arranged with the apex end thereof directed to the heel of the shoe; said plate defining a pair of like wing sections each extending to a side wall of said shoe; an inflatable air bladder secured to the underside of each plate wing section; a valve stem connected to each bladder and fitted to the side wall adjacent thereto; opposed elongated openings formed in the side walls of the shoe through each of which a free end of a stem extends; valve means on the free end of said valve stem arranged exteriorly of said shoe and free of contact with the foot; said plate wing sections and bladders being so constructed and arranged that upon inflation of a selected

one of said air bladders there will be provided a cushioned arch support adapting the shoe for use either on the right foot or the left foot depending on the air bladder selected for inflation, the plate wing section associated with the inflated bladder being flexed to conform to the arch of the foot on which the shoe is worn.

10. In combination with a shoe of the character described; an arch support comprising a flexible circular metallic plate secured to the sole of the shoe along a line coinciding with the longitudinal center line of said shoe; a pair of laterally disposed inflatable air bladders secured to said metallic plate and arranged beneath said plate; whereby upon inflation of one of said air bladders there will be provided a cushioned arch support adapting the shoe for use either on the right foot or the left foot depending on the air bladder selected for inflation.

11. In combination with a shoe of the character described; an arch support comprising a flexible plate symmetrical about an axis thereof and secured along said axis to the sole of the shoe on a line coinciding with the longitudinal center line of said shoe; and inflatable cushion means disposed beneath said plate, said means being selectively inflatable on either side of said axis to provide a cushioned arch support adapting the shoe for use either on the right foot or the left foot depending on which side the cushion means is located.

12. In combination with a shoe of the character described; an arch support comprising a flexible normally flat metallic plate symmetrical about an axis thereof and secured along said axis to the sole of the shoe on a line coinciding with the longitudinal center line of said shoe; and a pair of separate pneumatic cushion means disposed beneath said plate and each interchangeable from inflated to deflated condition from one side thereof on one side of said axis to the other side to provide a cushioned arch support adapting the shoe for use either on the right foot or the left foot depending on which side the inflated cushion means is located.

13. An arch support comprising a flexible flat metallic plate symmetrical about an axis co-extensive with the longitudinal extent of a shoe and defining like lateral wing sections, an inflatable air bladder secured to the underside of each wing section, each bladder having a valve stem communicating therewith, and a valve provided on the free end of each valve stem.

14. An arch support for a shoe comprising a heart-shaped flexible normally flat metallic plate defining a wing section on each side of its major axis, an inflatable air bladder secured to the underside of each wing section, a flexible valve stem for each bladder, and a valve provided on the free end of each valve stem.

15. An arch support for a shoe comprising a circular flexible normally flat metallic plate defining a wing section on each side of a diameter thereof, an inflatable air bladder secured to the underside of each wing section, a flexible valve stem for each bladder, and a valve provided on the free end of each valve stem.

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PNEUMATIC OR CUSHION ARCH SUPPORT FOR SHOES

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Fig. 1.

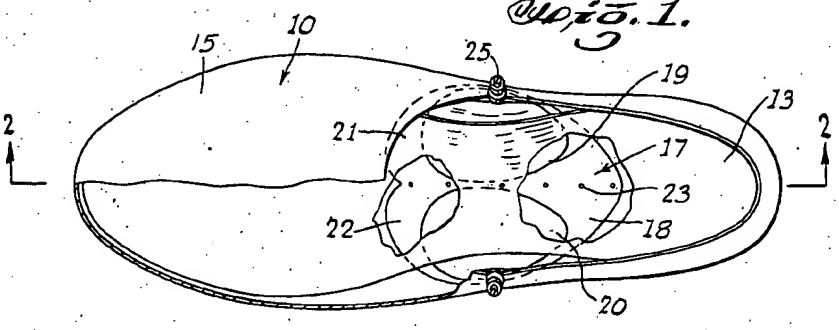
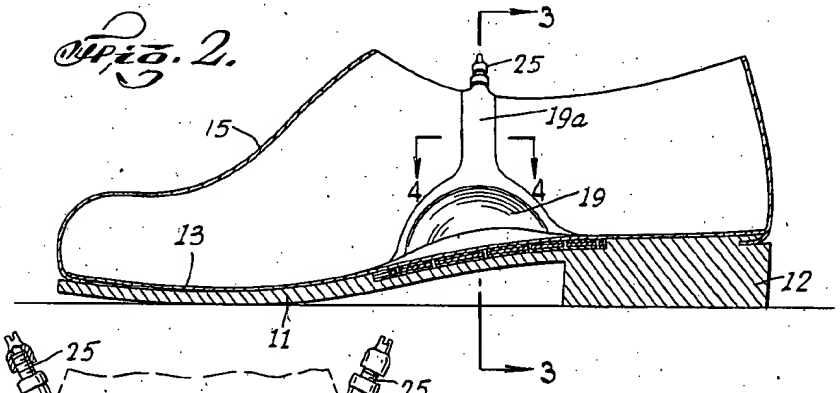


Fig. 2.



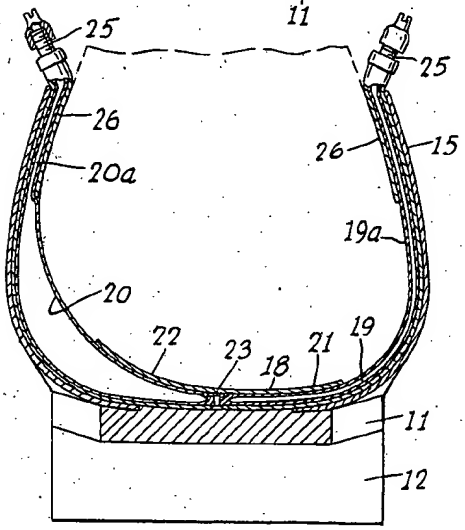
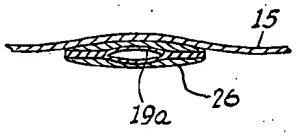


Fig. 3.

Fig. 4.



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PNEUMATIC OR CUSHION ARCH SUPPORT FOR SHOES

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Fig. 5.

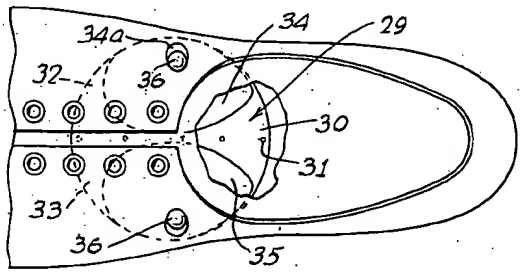


Fig. 6.

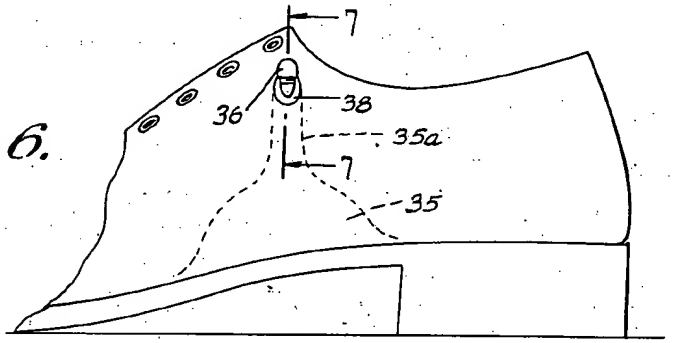


Fig. 7.

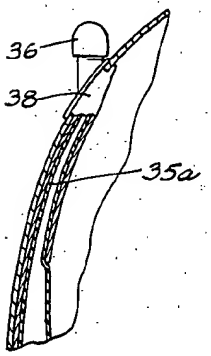
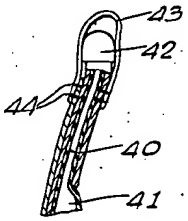


Fig. 8.



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